FINANCIAL INNOVATION SERIES

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The Great Fintech Debate:
Risks and Rewards of Financial Innovation

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"The challenge for policymakers is to ensure that fintech develops in a way that maximises the opportunities and minimises the risks for society. After all, the history of financial innovation is littered with examples that led to early booms, growing unintended consequences, and eventual busts."

-Mark Carney, Governor of the Bank of England

We have entered a new era of innovation where apps and digital devices streamline many aspects of our lives, where virtual assistants answer to our every beck and call, and where driverless cars will soon be sitting in our driveways. These innovations are bringing customer service to new heights, providing tailored experiences that increase efficiency, accessibility, and ease. Following suit, the financial services industry has seen a significant uptake in new innovative solutions like digital banking, blockchain, robo-advisors, and telematics, many of which are being introduced by new entrants to the market. But as we all know, there is no such thing as a free lunch. Financial technologies (fintechs[1]) bring many opportunities, but they also come with their own set of risks and, in some cases, exacerbate existing risks. And so, many are left asking: does innovation come at the cost of financial stability? Do the rewards of fintech really outweigh the risks?

To help address these questions, this report will provide an in-depth look at the major risks and opportunities that come with financial innovation. It will consider several vantage points including that of the incumbent financial institution, the consumer, and the financial system as a whole. We will also offer some insight with regards to potential risk-mitigation strategies and commentary on the potential for fintech-related risks to become systemic. For a detailed introduction to fintech and the Canadian fintech landscape, the reader is encouraged to review GRI's antecedent report entitled "An Overview of Fintech in Canada"[2].

1 *For clarity, this report will refer to financial technology as fintech. Financial technology companies will be referred to as fintech companies or fintech firms.*

2 *Watson, C., LaPlante, A., "An Overview of Fintech in Canada", Global Risk Institute, (2018)*

OPPORTUNITIES

There is no debate as to why we have witnessed a continued increase in fintech solutions coming to market. Simply put, they offer countless opportunities for cost savings, improved efficiency, and increased convenience for both individuals and businesses. Additionally, fintech can help bring financial services to individuals who may not have had prior access, effectively broadening the reach of financial services companies around the world.

Consumer

Fintech firms have begun to introduce a multitude of new and accessible products, putting pressure on the traditional financial institutions to do the same. This competition has led to a wider range of more efficient and cost-effective product and service offerings for both individual and small to medium-sized enterprise (SME) clients.

Robo-advisors, which have been growing in popularity, allow individuals to make investment decisions from the comfort of their own homes, and often at significantly reduced costs. For example, Wealthsimple, a leading robo-advisor in Canada, offers a 0% management fee for users with less than $5,000 invested during their first year. This mix of flexibility and affordability is particularly appealing to the younger, more tech-savvy generation who see less value in visiting a financial advisor face-to-face.[3] A similar shift can be seen in the credit space. Online origination platforms enable financial service providers to offer cost-effective, smaller-balance loans to households and SMEs by reducing loan processing and underwriting costs.[4] Moreover, peer-to-peer lending fintech firms can provide consumers with affordable credit when retail banks cannot by taking advantage of market-based funding.[5] This is part of a broader trend away from intermediaries and towards decentralized solutions.

Additionally, across the spectrum of financial services, big data, machine learning, and other advanced analytics methods are providing consumers with customized experiences tailored to their individual needs and circumstances.

Possibly the most notable consumer benefit of fintech, however, has been the drastic increase in financial inclusion around the world. In many jurisdictions, mobile phone ownership is far greater than the share of individuals with access to financial services. Mobile-based fintech products, including mobile banking, robo-advisors and mobile insurance products, have provided consumers in under-serviced regions with access to low-cost financial services.[6] In Kenya, for example, banking and payment services available through mobile phones has led to a 300% increase in adults who bank.[7]

3 *Basel Committee on Banking Supervision,"Sound Practices: Implications of fintech developments for banks and bank supervisors", BIS, (Aug 31, 2017)*

4 *Gordon Mills, K., McCarthy, B., 'The State of Small Business Lending: Innovation and Technology and the Implications for Regulation", Harvard Business School, Working Paper (Dec 14, 2016)*

5 *Carney, M., "The Promise of Fintech – Something New Under the Sun?", Bank of England, (Jan 25,2017)*

6 *Financial Stability Board, "Financial Stability Implications from FinTech Report – Supervisory and Regulatory Issues that Merit Authorities' Attention", (Jun 27, 2017)*

7 *Medcraft, G.,"Fintech: Opportunities, risks and challenges", Australian Securities and Investment Commission, (Dec 14, 2016)*

Financial Institutions

Although much of the hype around fintech tends to focus on the innovations of new fintech firms, financial innovation is old hat for traditional financial institutions (FIs). Pairing this with their long histories of established client relationships, FIs are particularly well placed to take advantage of the many opportunities that fintech brings, whether that be through internal innovation or collaboration with fintech firms.

Fintech has introduced numerous improvements to back office processes, including workflow automation and digital signing, resulting in increased efficiency, reduced costs and easier record keeping for compliance purposes. Machine learning and big data analytics have allowed for more innovative marketing, real-time customer service and enhanced risk management. Distributed ledgers have the potential to increase settlement speed, freeing up collateral and capital for other productive uses. Regulation technology (regtech) looks to streamline regulatory compliance by helping FIs meet their regulatory requirements and adapt to new regulations, and by supporting their reporting needs.[8]

Many of the benefits of fintech will allow FIs to build stronger relationships with their customers, whether those customers are large corporate clients, SMEs, or individuals, by allowing them to provide more timely service, customized products, and reduced costs. Moreover, fintech has the potential to contribute to the stability of the financial system as a whole by enabling more effective risk management, reducing information asymmetries, and augmenting settlement processes, amongst other things.

Financial System

Recent innovations have significantly reduced fixed costs and other entry barriers in the financial services industry, resulting in a wide range of new market participants who tend to focus narrowly on a particular technology that enhances or transforms a specific process or service. In addition, many established tech-companies who are experienced in the financial services sector, including Google, IBM and Microsoft, are looking to expand their activities. This competition-driven diversification and decentralization may help dampen the aggregate impact of idiosyncratic shocks and reduce risk concentration. For example, access to alternative funding sources lowers the concentration of credit in traditional FIs which may prove helpful in the event that one or more of these institutions falls on hard times.[9] More broadly, greater competition between new entrants and incumbents over the entire value chain will incentivise market participants to develop stable and sustainable businesses models resulting in heightened operational efficiency and a more resilient financial system.

Furthermore, new technologies that increase transparency will reduce information asymmetries, allowing for more accurate risk pricing and the creation of new risk-mitigation instruments. Consequently, investors will be able to better manage their risks, further reducing system-wide risk concentrations.[10]

8 *Ibid., 3, BCBS*

9 *Financial Stability Board, "FinTech Credit: Market Structure, Business Models and Financial Stability Implications", (May 22,2017)*

10 *Ibid., 6, FSB, (Jun 27, 2017)*

RISKS

Fintech presents numerous opportunities for all financial sector participants, including customers and incumbent financial institutions. With these rewards, however, come several risks that, if not properly identified, understood, and managed, may pose a threat to the soundness of our financial system. In fact, respondents to the Depository Trust and Clearing Corporation's 2017 Systemic Risk Barometer survey listed fintech as one of the most prominent sources of emerging risks.[11] This section will outline the major fintech-related risks that customers, traditional financial institutions, and the financial system face.

Consumer

Fintech companies share vulnerabilities with both traditional financial institutions and data-driven internet businesses, and so consumers face a wide variety of risks from engaging with these new industry players.

Like all data-driven businesses, fintech firms are vulnerable to hacks and data breaches. As we have learned from recent high profile examples like Target and Equifax,[12] the stakes are especially high when it comes to detailed personal and financial data. Unlike these large established companies with multi-million dollar cyber security budgets, fintech firms, particularly those in the start-up phase, have far fewer resources to allocate to cyber issues, which may make then more vulnerable to data breaches. Customers should keep this in mind if they chose to do business with these firms.

Other sources of consumer risk stem from the designations and regulatory requirements of the firms offering fintech solutions. Although regulation is often deemed a damper on innovation, the lack of regulatory oversight may lead to firms with naïve or, in some cases, no risk management function, making them particularly susceptible to shocks. Moreover, deposit-taking fintech firms are likely not party to government programs that backstop consumer deposits like those provided by the Canadian Deposit Insurance Corporation (CDIC) and the US's Federal Deposit Insurance Corporation (FDIC). Consequently, consumers may have little hope of recovering funds from failing fintech companies. Taking this one step further, new financial innovations like cryptocurrencies that are centered on anonymity make tracking fraud or stolen funds impossible. In 2014, for example, Mt. Gox, once the world's leading cryptocurrency exchange, announced that 850,000 bitcoins belonging to customers, worth approximately $460 million USD at the time, were missing and likely stolen. The exchange suspended trading, filed for bankruptcy and began liquidation proceedings in April of 2014.[13] Four years later, many customers have yet to receive any compensation for their losses and will, in all likelihood, never be made whole.

11 *The Depository Trust and Clearing Corporation, "Systemic Risk Barometer – 2018 Risk Forecast", (2018)*

12 *The 2013 Target data breach included financial data from 41 million customer payment card accounts, and contact information for 60 million target customers. In 2017, sensitive personal information was stolen from Equifax for 143 million American consumers.*

13 *McMillan, R., "The Inside Story of Mt. Gox, Bitcoin's$460 Million Disaster", Wired, (Mar. 3,2014)*

Financial Institutions

As financial innovation continues to change the landscape of the financial services industry, FIs must be cognizant of the risks brought by increased competition and market diversification, changing customer demand, and the technologies themselves.

Fintech firms represent a significant new source of competition, threatening the earnings of incumbent FIs. According to a recent report by McKinsey & Company, banks stand to lose 29–35% of their revenues to disruptors through customer churn and falling margins if they do not quickly adopt new technologies.[14] Moreover, there may be knock on effects from increased market saturation like heightened funding liquidity risk caused by increased deposit volatility from changing customer loyalties.

Although it is generally more difficult to enter an oligopoly like that of the Canadian banking sector, fintech companies are bringing a large number of innovative products to customers, forcing incumbents to adjust to a more competitive market. However, given their size and organizational structures, large FIs tend to be less agile and may require significant cultural change in order to execute strategic shifts. This can make the adoption and implementation of new technologies difficult. To facilitate the quick implementation and delivery of fintech solutions, many FIs have turned to collaborating with or outsourcing to fintech firms. Although these strategic partnerships will likely help reduce customer churn and revenue loss, they also introduce new risks including third-party/vendor management and cybersecurity threats that fall outside of the FI's perimeter.

Third-party/vendor management relates to an FI's ability to manage the outsourced components of its financial technology. FIs must monitor all relevant aspects of third-party vendors by establishing adequate processes around due diligence, contract management, and continual monitoring of third-party operations. These processes should continue for the lifespan of the engagement and should be reviewed if the vendor firm goes through any major operational or structural changes such as a merger or acquisition. If, for instance, an FI works with multiple vendors that are all acquired by the same firm, the FI would have more significant exposure to the acquiring firm than originally anticipated.

FIs that engage with external fintech firms must also be vigilant when it comes to customer privacy and data security and should establish ownership guidelines around customers and customer data. Moreover, as the financial services industry moves towards the use of open APIs,[15] FIs should inform their customers of the risks of sharing data with untrustworthy firms and should be clear as to who is liable for customer losses in such cases. More generally on the data front, FIs will need to ensure that all new fintech solutions, whether implemented internally or by third parties, follow privacy and data protection laws. This has become particularly relevant to many big data, machine learning, and AI applications.

As FIs continue to rely more heavily on complex statistical analysis, model risk will become significantly more important, placing new demands on risk managers to understand the intricacies of these analyses. Losses associated with model risk are often unreported, but evidence suggests that they can be substantial.[16] For instance, AXA Rosenberg Entities was fined $217 million by the U.S. Securities and Exchange Commission for concealing a significant error in the quantitative investment program used to manage client assets.[17] To avoid

14 *Daniel Drummer, Andre Hrenz, Philipp Siebelt, & Mario Thaten, "FinTech - Challenges and Opportunities: How digitization is transforming the financial sector", McKinsey & Company, (May 25, 2016), pp. 6*

15 *An open API is an application programming interface that provides developers with programmatic access to a proprietary software application or web service. The use of Open APIs in finance would enable 3rd party developers to build applications and services for FIs. Moreover, customers would have full control over what data they share with who.*

16 *Philipp Harle, Andras Havas, and Hamid Samandari, "The future of bank risk management", McKinsey&Company, (July 2016)*

17 *U.S. Securities and Exchange Commission, "SEC Charges AXA Rosenberg Entities for Concealing Error in Quantitative Investment Model", Press Release, (Feb 3, 2011)*

losses stemming from model errors, FIs must establish processes to rigorously evaluate the accuracy of their models; the Office of the Superintendent of Financial Institutions (OSFI) provides guidelines that aid FIs in developing these processes.[18]

Perhaps the most significant risk brought on by the fintech paradigm, however, is cyber risk. As financial institutions, fintech firms, and their customers become more interconnected, the number of entry points that hackers can target grows dramatically, increasing the likelihood that sensitive financial data will be compromised. The development of new tools like open APIs and cloud computing further increases the number of vulnerabilities. With new technologies emerging daily and hackers becoming ever more adept, institutions must allocate adequate resources to ensure that their firms remain secure and are capable of mitigating new threats.[19]

Financial System

At the moment, most fintech activities are small in comparison to the overall financial system and thus do not yet pose significant risks to financial stability. However, given the rapid evolution of the fintech space, this could change in the near future. Consequently, policymakers must be proactive in understanding how fintech is altering the business models of start-ups and incumbents and changing broader market structures, and they should address fintech-related risks with thoughtful supervision and regulation. This section will introduce possible areas of fintech-related risk concentration and propagation in the financial system.

As was learned from the great financial crisis, the highly interconnected nature of the financial system can quickly propagate shocks throughout the industry, leading to systemic events. In the context of fintech, there are several key macro-financial risks that, if left unchecked, could amplify shocks and raise the likelihood of financial instability. First and foremost, the rising interconnectedness and complexity of the market may lead to increased risk of contagion. Contagion may stem from more traditional sources, like reputational contagion, or from new, unpredictable sources, like unsupervised automation platforms or AI-based tools. In addition, pairing the growth in interconnectedness with new risks like cyber attacks mean that weak links in the system may heighten system-wide vulnerabilities, further increasing the risk of contagion.

As financial innovations continue to emerge, it is likely that new highly connected entities or infrastructure will exist in the future. Idiosyncratic shocks to these entities, whether driven by traditional financial risks or by fintech-related risks, have a greater chance of becoming systemic events. For example, a cyber-breach at an organization that is particularly vital to the functioning of the financial system, like a clearinghouse or a central bank, could have significant detrimental implications for financial stability. Similarly, an attack on a financial technology that has been widely adopted, like digital wallets or Amazon's cloud computing service, could have an equally devastating impact. Consequently, regulators will need to address how to effectively identify, oversee, and regulate new fintech-based systemically important institutions and infrastructure.

18 *Office of the Superintendent of Financial Institutions Canada, "Enterprise-Wide Model Risk Management for Deposit-Taking Institutions", Guideline, (2017)*

19 *Ibid., 6, FSB, (Jun 27, 2017)*

These concerns will only become more important as fintech firms continue to grow and begin to control a more significant portion of the market. Depending on their business models, fintech firms can be particularly susceptible to certain traditional financial risks, including maturity mismatch, liquidity mismatch and leverage, especially if they develop without the necessary risk management expertise. For one, in the fintech lending market loans can be sold before they mature which can expose investors to unmatched balance sheets. Liquidity mismatch and leverage are not yet areas of concern, as fintech credit platforms do not perform liquidity transformation and few engage in leverage, but this may change in the future.

The inherent design of a number of fintech activities may also contribute to other macro-financial issues including procyclicality and excess volatility. Prime examples of this are robo-advisors or alternative risk management algorithms, both of which can promote herding and thus lead to excess volatility and/or increased procyclicality. This is particularly true if the underlying algorithms are overly-sensitive to price movements or are highly correlated. Moreover, increased concentrations of model risk in the system due to greater reliance on advanced analytic techniques may have unforeseen consequences on financial stability.

The systemic risks posed by fintech create unique challenges for regulatory authorities and other governmental bodies. For example, many traditional financial institutions rely on third-party vendors to supply fintech solutions, and these vendors often fall outside of the scope of current financial regulations. Authorities should consider whether current regulatory frameworks adequately cover third-party fintech providers, particularly large providers that may increase interconnectedness by serving many financial institutions. Furthermore, innovations like cross-border lending and payments that interface with multiple legal jurisdictions will require deeper global regulatory coordination. Ultimately, the regulatory community's main challenge in this arena is to create policies that mitigate fintech-related risks and ensure the fair and efficient operation of our markets while preserving fintech's potential to transform the industry in positive ways.

CONCLUSION

The advent of fintech brings with it many new opportunities for consumers, traditional financial institutions, and startups. Consumers have access to a wider range of convenient, affordable, personalized services than ever before, and financial institutions can leverage more efficient models, automated solutions and the ability to reach more customers through mobile applications, increasing their revenue streams and growing their businesses. Financial stability also stands to benefit through improved transparency, increased efficiency and enhanced competition.

Fintech, however, also poses many risks to all market participants that should be identified, understood and managed. Customers should be mindful when sharing personal data and interacting with new un-vetted firms. Financial institutions should be cognizant of third-party risks, cybersecurity vulnerabilities and increased competition. And authorities need to work towards making sure robust oversight is in place for new-risks and that non-traditional service providers and fintech firms are subject to appropriate and practical regulatory rules.

As the fintech revolution continues to reshape the financial landscape, market participants will need to adapt to the new emerging innovations while vigilantly monitoring for associated risks and developing strategies to manage them.